Space Weather Forecast

Issued on Sunday, 03 March 2024 at 13:20 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate flares and Active geomagnetic intervals day 1 (03 Mar).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Low despite eight sunspots being present on the visible disc. Two moderately large, complex regions in the western hemisphere both underwent slight simplification and decay during the period. The remaining regions are smaller and appear mostly stable. The large, previously active sunspot in the northwest has rotated onto the sun's far side, but magnetic looping is still visible above the solar limb. No Earth-directed Coronal Mass Ejections (CMEs) were detected.

Solar Wind / Geomagnetic Activity: Solar winds were at ambient levels throughout, however, solar wind parameters became enhanced due to CME activity from around 03/0845 UTC. Speeds increased to peak at 375km/s, but have since eased to around 340km/s. The interplanetary magnetic field was generally weak, but peaked at strong levels following the CME arrival. The north-south component generally varied weakly, but varied between moderately positive (northward) and strongly negative (southward) towards the end of the period. Geomagnetic activity was largely Quiet, but with Unsettled (Kp3) intervals (03/0000-0300 UTC and 03/0900-1200 UTC).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is expected, with a chance of isolated Moderate-class flares, this risk likely decreasing between days 1 and 2 (03 and 04 Mar) in the absence of any further sunspot development.

Solar Wind / Geomagnetic Activity: Ongoing effects from one or more CMEs that arrived earlier on day 1 (03 Mar) should diminish by early day 2 (04 Mar) with no further CMEs in the current forecast. Otherwise Earth is expected to remain in a background solar wind environment with no significant coronal hole high speed streams expected. Unsettled to Active Geomagnetic activity at first, with a very slight chance of a G1/Minor Storm interval from lingering CME effects. Then easing to become Quiet from day 2 (04 Mar) onwards.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist at background levels, but with a slight chance of rising above the S1/Minor Radiation Storm threshold in response to any notable flares from the large sunspot which has rotated beyond the northwest limb in the past 24 hours.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	30	30	30
Very Active	R3 to R5 X	No	5	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	10	5	5
Very Active	≥ S3 *	No	5	3	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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